

We claim:

1. A composition comprising one or more fuel additives in a form of a gel used in an application selected from the group comprising decreasing the amount of soot in the lubricating oil engine, decreasing the amount of emissions in the engine exhaust and combinations thereof.
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2. The composition of claim 1 wherein the gel comprises a dispersant, a detergent and an antioxidant.
3. The composition of claim 1 wherein the gel is represented by the formula A+B+C wherein A equals at least one component with at least one or more reactive or associative groups; wherein B equals a particle or other component with at least one group which reacts or associates with component A to form a gel and wherein C is at least one or more fuel additives.
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4. The composition of claim 1 wherein the emissions reduced are selected from the group comprising soot, NOx, hydrocarbons and combinations thereof.
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5. The composition of claim 3 wherein component A is selected from the group comprising antioxidants, dispersants, succinics, maleic anhydride styrene copolymers, maleated ethylene diene monomer copolymers, surfactants, emulsifiers, functionalized derivatives of such components and combinations thereof and in the range of about 0.1% to about 95% of the gel.
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6. The composition of claim 3 wherein component B is selected from the group comprising dispersants, detergents, overbased detergents, carbon black, silica, alumina, titania, magnesium oxide, calcium carbonate, lime, clay, zeolites and combinations thereof and in the range of about 0.1 % of about 99% of the gel.
7. The composition of claim 3 wherein component C is selected from the group comprising antioxidants, extreme pressure agents, wear reduction agents, viscosity index improvers, anti-foaming agents, combustion modifiers and combinations thereof and in the range of about 0% to about 95% of the gel.
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8. The composition of claim 7 further comprising at least one fuel additive selected from the group comprising friction reducing agents, extreme pressure (EP) agents, wear reduction agents, viscosity index improvers, anti-foaming agents, anti-

misting agents, cloud-point depressants, pour-point depressants, mineral or synthetic oils, anti-knock agents, lead scavengers, dyes, cetane improvers, rust inhibitors, bacteriostatic agents, gum inhibitors, fluidizers, metal deactivators, demulsifiers, anti-icing agents, lubricity additives, friction modifiers, viscosity improvers, flow improvers, low temperature improvers, anti-static agents, valve-seat recession agents, intake valve deposit control additives, combustion chamber deposit control additives, fuel injector deposit control additives and combinations thereof.

5 9. The composition of claim 3 further comprising a fuel-borne catalysts (organometallic compounds of e.g. Na, K, Co, Ni, Fe, Cu, Mn, Mo, Va, Zi, Be, Pt, Pa, Ce, Cr, Al, Th, Se, Bi, Cd, Te, Th, Sn, Ba, B, La, Ta, Ti, W, Zn, Ga, Pb, Ag, Au, Os, Ir) and combinations thereof in the fuel.

10 10. The composition of claim 2 wherein the gel comprises an overbased detergent and an ashless succimide dispersant and wherein the ratio of detergent to dispersant is of about 10:1 to about 1:10 and wherein the total base number (TNB) of the overbased detergent is in the range from about 100 to about 400.

15 11. The composition of claim 2 when the dispersant is selected from the group comprising ashless succinimide, polyisobutylene succinimide, substituted long chain alkenyl succinimides, high molecular weight esters, mannich dispersants, N-substituted long chain alkenyl succinimides, carboxylic dispersants, amine dispersants, polymeric dispersants, decyl methacrylate, vinyl decyl ether, aminoalkyl acrylates, acrylamides, poly-(oxyethylene)-substituted acrylates, high molecular weight olefins with monomers containing polar substitutes and a mixtures thereof; and a detergent selected from the group comprising overbased sulfonates, phenates, salicylates, carboxylates, overbased calcium sulfonate detergents, overbased detergents containing metals such as Mg, Ba, Sr, Na, Ca and K and mixtures thereof; and an antioxidant selected from the group comprises alkyl-substituted phenols, 2, 6-di-tertiary butyl-4-methyl phenol, phenate sulfides, phosphosulfurized terpenes, sulfurized esters, aromatic amines, hindered phenols and hindered, ester-substituted phenol and mixtures thereof.

20 12. A process comprising contacting in the range of a portion to all of the components of a gel of the composition of claim 3 in the combustion chamber of an

engine resulting in the reduction of soot in the engine oil, emissions in the engine exhaust and combinations thereof and wherein the emissions reduced in the exhaust are selected from the group comprising soot, NOx, hydrocarbons and combinations thereof.

5 13. A process comprising contacting in the range of a portion to all of the components of a gel of the composition of claim 2 resulting in the reduction of soot in the engine oil and/or emissions in an engine exhaust.

10 14. The process of claim 12 wherein the gel is positioned to contact the fuel in an area selected from the group comprising full flow oil, bypass of oil, in the reservoir and combinations thereof.

15 15. The process of claim 12 wherein the gel is located in an area selected from the group comprising a filter, fuel filter, fuel bypass loop, fuel pump, injectors canister, housing, reservoir, pockets of a filter, canister in a filter, mesh in a filter, canister in a bypass system, mesh in a bypass system, canister in a tank, mesh in a tank, manifolds, inlets and/or outlets of fuel tank, fill fuel pipe, valves in fuel system, fuel chambers, fuel drain, intake air system, positive crank case ventilation system, air intake filter, exhaust gas recirculation (egr) system and combinations thereof.

20 16. The process of claim 15 wherein the gel is located in more than one location then the gel formulation can be identical, similar, different or combinations thereof.

17. The process of claim 12 wherein the gel is in contact with the fuel system in the range of about 100% to 1% of the fuel in the engine.

25 18. The process of claim 12 wherein the gel at the end of its service life contains in the range of none to a portion of the components in the gel remaining at the end of the service life of the gel due to selective dissolution of the gel.

19. The process of claim 12 comprising adding the components of the gel to the fuel system in the range of all at the same time to a portion of the components of the gel over its service life.

30 20. A fuel filter for an engine fuel system comprising a housing, a filter for removing particulate matter from a fuel filter and a container with a gel wherein the

gel comprises a dispersant, a detergent, and an antioxidant and results in the reduction of soot, emissions or combinations thereof from an engine.

21. A gel containment device for a fuel system comprising a housing in a fuel system and a container with a gel in the housing, and wherein the gel comprises
5 a dispersant, a detergent and an antioxidant for the soot reduction, emissions reduction or combinations thereof from an engine.

22. A fuel for an internal combustion engine comprising;
10 a) a fuel at 20°C and
 b) a gel comprising a dispersant, a detergent and of an antioxidant,
resulting in the soot reduction, emissions reduction or combinations thereof from the engine.

23. An internal combustion engine comprising
15 a) an internal combustion engine,
 b) a liquid fuel at 20°C,
 c) a gel comprising a dispersant, a detergent and of an antioxidant..
 d) a reservoir containing at the gel supplying the gel component to the fuel in the fuel system of the engine resulting in the soot reduction, emissions reduction or combinations thereof from the engine.

24. An internal combustion engine according to claim 23, including an
20 exhaust after treatment device that traps particulate (e.g. diesel particulate trap), oxidizes and/or reduces selected exhaust gas components, or traps or converts NOx to other compounds, or said engine is equipped with a system to recirculate exhaust gases to the intake air supply for said engine.

25. A fuel according to claim 22, wherein said fuel is characterized as a liquid fuel including diesel fuel, gasoline fuel, liquefied petroleum gas (LPG) an emulsified fuel, or combination thereof.

26. A fuel according to claim 22 wherein said fuel is characterized as a gaseous fuel, including natural gas, methane, ethane, propane or combinations thereof.